

IN THE CLAIMS:

1. (Currently Amended) A solar cell module comprising:[[-]]
[[iv)] i) a rigid or flexible superstrate and/or substrate;
[[v)] ii) one or more solar cells, and
[[vi)] iii) a cured liquid silicone encapsulant selected from the group
of a hydrosilylation cure reaction product, a peroxide cure reaction
product and a UV cure reaction product.
2. (Currently Amended) A solar cell module in accordance with claim 1 wherein
[[the]] said solar cell is either a wafer or a thin film and wherein said solar cell is
made from a semi-conductor material ~~crystalline or polycrystalline silicon or thin
film silicon, e.g. amorphous, semi-crystalline silicon, gallium arsenide, copper
indium diselenide, cadmium telluride, copper indium gallium diselenide,
mixtures including any one or more of the latter.~~
3. (Currently Amended) A solar cell module in accordance with claim 1 [[or 2]]
wherein [[the]] said solar cell is a wafer ~~made from~~ and wherein said solar cell is
made from a semi-conductor material that is polycrystalline or single crystal
silicon.
4. (Currently Amended) A solar cell module in accordance with claim 1 [[or 2]]
wherein [[the]] said solar cell is a thin film ~~made from~~ and wherein said solar cell
is made from a semi-conductor material that is thin film silicon[[,]] or copper
indium gallium diselenide.
5. (Currently Amended) A solar cell module in accordance with ~~any preceding~~
claim 1 wherein said cured liquid silicone encapsulant is formed from a liquid
silicone encapsulant composition and the viscosity of ~~the final~~ said liquid silicone
encapsulant composition is ~~preferably~~ from 100 to 10 000 mPa.s measured at
25°C.
6. (Currently Amended) A solar cell module in accordance with ~~any preceding~~

claim 1 wherein said cured liquid silicone encapsulant is formed from a liquid silicone encapsulant composition which ~~the liquid silicone encapsulant~~ comprises;

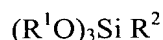
Component (A) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule and a viscosity at 25°C of from 100 to 15,000 mPa.s;

Component (B) 20 to 50 parts by weight of a silicone resin containing at least two alkenyl groups;

Component (C) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups is from 0.1: 1 to 5: 1; and

Component (D) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (A).

7. (Original) A solar cell module in accordance with claim 6 wherein the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (A) is >1:1.
8. (Currently Amended) A solar cell module in accordance with claim 6 [[or 7]] wherein [[the]] said liquid silicone encapsulant composition additionally comprises one or more adhesion promoter(s) and/or an anti-soiling agent(s) and/or cure inhibitor(s) and/or a silane of the formula:[[-]]



wherein R¹ is an alkyl group comprising 1 to 6 carbon atoms, R² is selected from

the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group.

9. (Currently Amended) A solar cell module in accordance with ~~any preceding~~ claim 1 wherein said cured liquid silicone encapsulant is formed from a liquid silicone encapsulant composition and there is provided further comprising an adhesive layer ~~comprising also formed from said~~ [[a]] liquid silicone adhesive encapsulant composition and adapted to adhere said solar [[cells]] cell on to [[a]] said superstrate [[or]] and/or substrate.
10. (Currently Amended) A solar cell module in accordance with ~~any preceding~~ claim 9 wherein the viscosity of ~~the final~~ said liquid silicone encapsulant composition is ~~preferably~~ from 100 to 2000 mPa.s measured at 25°C
11. (Currently Amended) A solar cell module in accordance with claim 9 [[or 10]] wherein [[the]] said liquid silicone encapsulant composition ~~adhesive~~ comprises :[-]

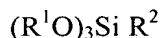
Component (Ai) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule and a viscosity at 25°C of from 100 to 10,000 mPa.s;

Component (Bi) 20 to 40 parts by weight of a silicone resin containing at least two alkenyl groups;

Component (Ci) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups is from 0.1: 1 to 1: 1; and

Component (Di) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (Ai).[[.]]

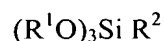
12. (Currently Amended) A solar cell module in accordance with claim ~~[[6]]~~ 11 wherein the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups in component (Ai) is <1:1.
13. (Currently Amended) A solar cell module in accordance with claim 11 ~~[[or 12]]~~ wherein ~~the adhesive~~ said liquid silicone encapsulant composition additionally comprises an adhesion promoter and/or a cure inhibitor and/or a silane of the formula: ~~[[.]]~~



wherein R¹ is an alkyl group comprising 1 to 6 carbon atoms, R² is selected from the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group.

14. (Currently Amended) A solar cell module comprising one or more solar cells, an adhesive, and an encapsulant wherein ~~[[the]]~~ said encapsulant comprises a resin fraction of between 20% to 90% by weight and ~~[[the]]~~ said adhesive ~~[[has]]~~ comprises a resin fraction of from ~~20-30%~~ 20% to 30% by weight.
15. (Currently Amended) A solar cell module in accordance with ~~any preceding~~ claim 14 wherein ~~[[the]]~~ said encapsulant cures without releasing volatiles.
16. (Currently Amended) A solar cell module in accordance with ~~any preceding~~ claim 14 wherein ~~the cured silicone~~ said encapsulant and/or adhesive exhibits a light transmission substantially equivalent to glass.

17. (Currently Amended) A solar cell module in accordance with ~~any preceding~~ claim 14 wherein ~~[[the]] said solar cell or series of solar cells are~~ is pre-treated prior to adhesion and/or encapsulation with a silane of the formula: ~~[[-]]~~



wherein R^1 is an alkyl group comprising 1 to 6 carbon atoms, R^2 is selected from the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group.

18. (Currently Amended) A continuous solar cell module encapsulation process comprising the steps of uniformly applying by spraying, coating or dispensing a predetermined volume of a liquid silicone encapsulant composition onto a solar cell module and curing ~~[[said]]~~ the encapsulant composition thermally or by infrared radiation.
19. (Currently Amended) A continuous solar cell module encapsulation process in accordance with claim 17 ~~with an encapsulant~~ 18 wherein the encapsulant composition comprises:

Component (A) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule and a viscosity at 25°C of from 100 to 15,000 mPa.s;

Component (B) 20 to 50 parts by weight of a silicone resin containing at least two alkenyl groups;

Component (C) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups is from 0.1: 1 to 5: 1; and

Component (D) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (A)

~~in accordance with any one of claims 5 to 8. A continuous solar cell module encapsulation process in accordance with claim 17 or 18 wherein the liquid silicone encapsulant is applied using a curtain coater.~~

20. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 19~~ claim 18 wherein the liquid silicone the encapsulant composition is cured in a continuous oven.
21. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 20~~ claim 18 wherein the ~~resulting~~ layer ~~[[of]]~~ resulting from the encapsulant composition is a uniform thin film coating having a thickness ranging from 20 μm to 1200 μm .
22. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 20~~ claim 18 wherein a liquid silicone adhesive is applied on to the solar cell module and cured prior to the introduction of the encapsulant composition.
23. (Currently Amended) A continuous solar cell module encapsulation process in accordance with claim ~~[[21]]~~ 22 wherein the liquid silicone adhesive ~~has a composition in accordance with any one of claims 11 to 13~~ comprises:

Component (Ai) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule and a viscosity at 25°C of from 100 to 10,000 mPa.s;

Component (Bi) 20 to 40 parts by weight of a silicone resin containing at least two alkenyl groups;

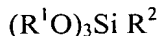
Component (Ci) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups is from 0.1: 1 to 1: 1; and

Component (Di) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (Ai).

24. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 23~~ claim 18 wherein the means of applying the encapsulant composition is adapted such that the encapsulant composition is applied in a uniform bubble-free or substantially bubble-free film on the top of a solar cell in the solar cell module.
25. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 24~~ claim 18 wherein the uniform application of the liquid silicone encapsulant composition results in a layer of the encapsulant composition and deposition of a solar cell or series of solar cells into ~~a first the layer of the liquid silicone encapsulant composition or liquid silicone adhesive~~ is by a vacuum gripper controlled by six axis robot, or other automatic placement, and a seventh axis or other gripper is utilised to control the placement ~~of the solar cell array into a very thin liquid layer of 100 to 700 µm.~~
26. (Currently Amended) A continuous solar cell module encapsulation process in accordance with ~~any one of claims 17 to 24 where~~ claim 18 wherein a thermoplastic or thermo-elastomeric material is applied to form a frame surrounding a cured module to protect ~~[[the]]~~ edges of the ~~[[panel]]~~ cured module

from water ingress.

27. (Currently Amended) A continuous solar cell module encapsulation process ~~solar cell module~~ in accordance with ~~any one of claims 17 to 24~~ claim 18 wherein a silane of the formula: $[(R^1O)_3SiR^2]$



wherein R^1 is an alkyl group comprising 1 to 6 carbon atoms, R^2 is selected from the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group; is utilised to pre-treat a solar cell or series of solar cells prior to adhesion and/or encapsulation.

28. (Currently Amended) Use of a liquid silicone encapsulant composition to encapsulate a solar cell module.
29. (Currently Amended) Use in accordance with claim 28 wherein the encapsulant [[is a]] composition comprises;

Component (A) 100 parts by weight of a liquid diorganopolysiloxane having at least two Si-alkenyl groups per molecule and a viscosity at 25°C of from 100 to 15,000 mPa.s;

Component (B) 20 to 50 parts by weight of a silicone resin containing at least two alkenyl groups;

Component (C) a cross-linking agent in the form of a polyorganosiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount such that the ratio of the number of moles of silicon-bonded hydrogen to the total number of moles of silicon-bonded alkenyl groups is from 0.1: 1 to 5: 1; and

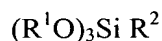
Component (D) a hydrosilylation catalyst wherein the amount of metal in said hydrosilylation catalyst is from 0.01 to 500 parts by weight per 1,000,000 parts by weight of component (A)

~~in accordance with any one of claims 5 to 9.~~

30. A solar cell module obtainable by the method ~~in accordance with any one of claims 17 to 26~~ claim 18.

Please add the following new claims.

31. (New) A solar cell module in accordance with claim 2 wherein said semiconductor material is selected from the group consisting of crystalline silicon, polycrystalline silicon, single crystal silicon, thin film silicon, amorphous silicon, semi crystalline silicon, gallium arsenide, copper indium diselenide, cadmium telluride, copper indium gallium diselenide, and mixtures thereof.
32. (New) A solar cell module in accordance with claim 1 wherein said encapsulant cures without releasing volatiles.
33. (New) A solar cell module in accordance with claim 1 wherein said encapsulant exhibits a light transmission substantially equivalent to glass.
34. (New) A solar cell module in accordance with claim 1 wherein said solar cell is pre-treated prior to encapsulation with a silane of the formula:



wherein R^1 is an alkyl group comprising 1 to 6 carbon atoms, R^2 is selected from the group of an alkoxy group comprising 1 to 6 carbon atoms, an alkyl group comprising 1 to 6 carbon atoms, an alkenyl group comprising 1 to 6 carbon atoms, an acrylic group or an alkyl acrylic group.

35. (New) A continuous solar cell module encapsulation process in accordance with claim 18 wherein the encapsulant composition is applied using a curtain coater.